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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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	Application No.	Applicant(s)		
	10/540,577	KIKUCHI ET AL.		
Office Action Summary	Examiner	Art Unit		
	SAVITHA RAO	1614		
The MAILING DATE of this communication app Period for Reply	pears on the cover sheet with the o	correspondence address		
A SHORTENED STATUTORY PERIOD FOR REPLY WHICHEVER IS LONGER, FROM THE MAILING D. - Extensions of time may be available under the provisions of 37 CFR 1.1 after SIX (6) MONTHS from the mailing date of this communication. - If NO period for reply is specified above, the maximum statutory period of Failure to reply within the set or extended period for reply will, by statute Any reply received by the Office later than three months after the mailing earned patent term adjustment. See 37 CFR 1.704(b).	ATE OF THIS COMMUNICATION 36(a). In no event, however, may a reply be tir will apply and will expire SIX (6) MONTHS from a, cause the application to become ABANDONE	N. nely filed the mailing date of this communication. D (35 U.S.C. § 133).		
Status				
1) Responsive to communication(s) filed on 10/2	action is non-final. nce except for formal matters, pro			
Disposition of Claims				
4) ☐ Claim(s) 1,37,38,40,41,43-45,54-56 and 58-62 4a) Of the above claim(s) is/are withdra 5) ☐ Claim(s) is/are allowed. 6) ☐ Claim(s) 1, 37-38, 40-41, 43-45, 54-56 and 58 7) ☐ Claim(s) 44 is/are objected to. 8) ☐ Claim(s) are subject to restriction and/o	wn from consideration. -62 is/are rejected.			
Application Papers				
9) The specification is objected to by the Examine 10) The drawing(s) filed on is/are: a) accomplicant may not request that any objection to the Replacement drawing sheet(s) including the correct 11) The oath or declaration is objected to by the Examine	epted or b) objected to by the drawing(s) be held in abeyance. Setion is required if the drawing(s) is ob	e 37 CFR 1.85(a). jected to. See 37 CFR 1.121(d).		
Priority under 35 U.S.C. § 119				
 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a) All b) Some * c) None of: 1. Certified copies of the priority documents have been received. 2. Certified copies of the priority documents have been received in Application No. 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). * See the attached detailed Office action for a list of the certified copies not received. 				
Attachment(s) 1) Notice of References Cited (PTO-892) 2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date	4) Interview Summary Paper No(s)/Mail D 5) Notice of Informal F 6) Other:	ate		

DETAILED ACTION

Claims 1, 37-38, 40-41, 43-45, 54-56 and 58-62 are pending

Amended claims set submitted on 10/26/2009 is acknowledged where claim 1 40-41, 44-45, 54-55 and 59-62 were amended and claims 39, 46-53 and 63-69 are cancelled. Claims under consideration in the instant action are claims 1, 37-38, 40-41, 43-45, 54-56 and 58-62.

Applicants' arguments, filed 10/26/2009, have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Applicants arguments with regards to their claim to foreign priority of JP 2002-379003 is acknowledged and is found to be persuasive. Examiner also acknowledges receipt of the foreign priority document submitted on 10/26/2009. Accordingly, Rejections referencing the WO '932 (Migaly) and Winnans et al. has been withdrawn since they do not qualify as prior art considering the foreign priority date of the instant application.

Claim Objections

Claim 44 is objected to because of the following informalities: Claim 44 has the term "disorder" misspelled as "disorderor". Appropriate correction is required.

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Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 and 54 and dependent claims 40-45 and 58-62 respectively are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Amended claim 1, 2nd line, and amended claim 54, lines 8-9; recites the phrase "selected from aripiprazole". This phrase renders claims 1 and 54 vague and indefinite because there is only one selection, however, in conflict the "selected from" wording suggests selection options of at least 2 items.

Claim Rejections - 35 USC § 103

New grounds of Rejection

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- 1. Determining the scope and contents of the prior art.
- 2. Ascertaining the differences between the prior art and the claims at issue.
- 3. Resolving the level of ordinary skill in the pertinent art.
- 4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 37-38, 41, 43-45, 54-56 and 59-62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong et al. et al(US 2002/0156067, already of record) and Jordan et al. (US 2002/0173513) further in view of Harvey et al (reference already of record) as evidenced by Owens et al (reference already of record)

Jordan et al. teaches a method of treating a patient suffering from a disorder of the central nervous system associated with the 5-HT_{1A} receptor subtype [0035]. Jordan et al. teaches carbostyril derivatives represented by the following formula (1) where the

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carbon-carbon atom between 3 and 4-positions in the carbostyril skeleton is a single or a double bond.

Jordan et al. teaches his inventive compounds to be a potent, partial 5HT_{1A} receptor agonist and as being useful in the treatment of various disorders of the central nervous system associated with the 5-HT_{1A} receptor which includes various forms of depression such as endogenous depression, major depression, melancholia and treatment resistant depression etc. ([0042], reference claims 1 and 21-22). Jordan et al. teaches the method of treatment wherein the inventive carbostyril compound is aripiprazole, which is the compound of formula 1 above where the carbon-carbon atom between 3-4 position is a single bond (reference claim 20) and further teaches that compounds of his invention can be suitably prepared into pharmaceutically acceptable formulations [0043]..As such an ordinarily skilled artisan would be motivated to utilize either aripiprazole in the treatment of mood disorders specifically depression from the teachings of Jordan et al.

Jordan et al. however does not teach the composition or methods to treat depression comprising a combination of aripiprazole in combination with a serotonin reuptake inhibitor such as citalopram

However, Wong et al. expressly teaches pharmaceutical composition and methods of their use comprising a) one or more norepinephrine reuptake inhibitors and b) one or more neuroleptic agents (Reference claim 1). Wong et al. describes his inventive composition to provide relief from several nervous system disorders with reduced side effects [0003] Wong et al. teaches among the compounds listed for component a)norepinephrine reuptake inhibitors are duloxetine, venlafaxine, and milnacipran (Reference claim 2). Among the compounds listed by Wong et al. as neuroleptic agents, component b) is aripiprazole (Reference claim 5). Example 2 describes the preparation of the composition, in that the active components are combined in a pharmaceutically acceptable carrier [0047]. Wong et al. discloses that the composition of his invention is used to treat any of the diseases or disorders of the central nervous system. Representative diseases or disorders include, but are not limited to the following: depression, schizophrenia, neurodegenerative disorders, migraine headaches, cluster headaches, an age-associated learning and mental disorder, bipolar disorder, a movement disorder (e.g., Tourette's syndrome)etc. ([0042] and claims 1,2,5,9 and 19). Wong et al. teaches that both commonly used typical and atypical neuroleptic agents can cause number of neurological side effects [0013-0014]. Wong et al. also teaches the need for pharmaceutical compositions that would have both the therapeutic benefits of the neuroleptic agents (typical or atypical) but with reduced side effects [0013]. Furthermore Wong et al. teaches that the combination of the norepinephrine reuptake inhibitor with a neuroleptic provides rapid relief to those suffering from disorders of the central nervous system with a minimal amount of

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deleterious side effects, more typically that the incidence of weight gain typically associated with the administration of atypical neuroleptic agents in minimized by the administration of the norepinephrine reuptake inhibitors. [0044].

With references to the specific serotonin reuptake inhibitors citalogram and escitalopram claimed in the instant application, these two drugs elicit anti-depressant effect by inhibiting serotonin reuptake. Although Wong et al. is silent as to these specific drugs, Wong et al. cites drugs such as venlafaxine, which also inhibits serotonin reuptake as evidenced by Harvey et al (Arch Gen Psychiatry/ vol 57, May 2000, page 503-509). Harvey teaches that venlafaxine is an antidepressant with a mechanism of action that is believed to involve inhibition of the uptake pumps for serotonin and norepinephrine (page 503, left col. 1st paragraph) and concludes that the in-vivo evidence in healthy humans suggests that both serotonin (5-HT) and norepinephrine uptake inhibitions are mechanisms of action of venlafaxine. Citalopram and escitalopram are also serotonin reuptake inhibitors as evidenced by Owens (CNS Spectr, abstract, 2002 Apr/ 7 (4) page 34-9). Owens teaches that citalogram is one of a selective serotonin reuptake inhibitor and it's S-enantiomer also known as escitalopram is one of the most selective serotonin reuptake inhibitor available. As such venlafaxine taught by Wong et al. is a functional equivalent of citalogram and escitalopram and thus substitution of the antidepressants taught by Wong et al. with other similarly functioning drugs such as citalogram or escitalogram would have been obvious to one of ordinary skill in the art at the time of invention. Substituting equivalents, namely serotonin reuptake inhibitors, motivated by the reasonable

expectation that the respective species will behave in a comparable manner or even provide comparable results in related circumstances, see *In re Ruff*, 256 F.2d 590, 118 USPQ 340 (CCPA 1958) is prima facie obvious. Moreover, the express suggestion to substitute one equivalent for another need not be present to render the substitution obvious, see *In re Font* 213 USPQ 532. Due to the fact that Harvey et al. teaches venlafaxine as a serotonin reuptake inhibitor and Owens teaches citalopram and escitalopram as also serotonin reuptake inhibitor both useful for the treatment of depression and Wong et al teaches the combination of atypical antipsychotic drug such as aripiprazole with serotonin reuptake inhibitor such as Venlafaxine, the references provide the skilled artisan with the necessary motivation to use citalopram or escitalopram in combination with a atypical antipsychotic such as aripiprazole in the composition of Wong et al. for the treatment of mood disorders.

In view of the foregoing references, the instantly claimed pharmaceutical composition would have been prima facia obvious to one of ordinary skill in the art at the time the invention was made. Jordan et al. explicitly teaches aripiprazole as being an effective drug in the treatment of mood disorders such as depression. Wong et al. et al. teaches pharmaceutical composition comprising of (a) one or more norepinephrine reuptake inhibitors such as venlafaxine and (b) one or more neuroleptic agents such as aripiprazole. Harvey and Owens teach that Citalopram an escitalopram are functional equivalents of venlafaxine. Accordingly all of the materials instantly claimed were known in the art to be used for treatment of the disorders of the central nervous system more specifically depression. The prior art also teaches solution to the problem of decreasing

adverse effects experienced with treatment of neuroleptics alone by combining with a serotonin reuptake inhibitors. This solutions to the prior art problem which is the combination of the neuroleptics with norepinephrine reuptake inhibitors also provides the skilled artisan motivation to combine the references. Moreover, both aripiprazole and serotonin reuptake inhibitors such as citalogram/escitalogram are individually known in the art as agents to combat depression, whose efficacy when administered alone is well established for the treatment of depression. First, It is generally obvious to combine two compositions, each of which is taught by the prior art to be useful for the same purpose, in order to form a third composition to be used for the very same purpose. In re Kerkhoven, 205 U.S.P.Q. 1069 (CCPA 1980). The idea for combining said compositions flows logically from their having been individually taught in the prior art. In re Crockett, 126 U.S.P.Q. 186, 188 (CCPA 1960). Accordingly, to establish obviousness in such fact situations it is NOT necessary that the motivation come explicitly from the reference itself. The natural presumption that two individually known antidepressant would, when combined, provide a third composition also useful for treating depression flows logically from each having been individually taught in the prior art. In addition, In re Diamond and Kellman, 149 USPQ 562 (C.C.P.A. 1966), supports the obviousness of combining two drugs known to be useful for the same purpose. In Diamond, Appellants were claiming a combination of adenosine-5-monophosphate (A5MP) and a glucocorticoid. The Examiner cited prior art teaching that A5MP and glucocorticoids were known in the art to be useful for treating collagen diseases and that combining drugs for the treatment of disease is suggested by the prior art.

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Appellants argued that the combination of the two drugs is non-obvious since there is no teaching to combine these two out of all known anti-inflammatory agents. The Court was not persuaded by this argument, stating that:

"...we think it clear that it is a standard practice in this art to combine ingredients."

"We are not convinced of non-obviousness of the combination of the two drugs, A5MP and a glucocorticoid such as hydrocortisone, for use as an anti-inflammatory composition, particularly since the record supports the solicitor's contention that the drugs selected are two of the commonly used drugs in the treatment of such collagen diseases."

Finally, the strongest rationale for combining references is a recognition, expressly or impliedly in the prior art or drawn from a convincing line of reasoning based on established scientific principles or legal precedent, that some advantage or expected beneficial result would have been produced by their combination. *In re Sernaker*, 702 F.2d 989, 994-95, 217 USPQ 1, 5-6 (Fed. Cir. 1983).

The Examiner would like to draw Applicant's attention to the following: "[w]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious". *KSR v. Teleflex*, 127 S,Ct. 1727, 1740 (2007) (quoting *Sakraida v. A.G. Pro*, 425 U.S. 273, 282 (1976). "[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious", the relevant question is "whether the improvement is more than the predictable use of prior art elements according to their established functions." (*id.*). Addressing the issue of obviousness, the Supreme Court noted that the analysis under 35 USC 103 "need not

seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." KSR v. Teleflex, 127 S.Ct. 1727, 1741 (2007). The Court emphasized that "[a] person of ordinary skill is... a person of ordinary creativity, not an automaton." id at 1742. Consistent with this reasoning, it would have been obvious to have selected various combinations of various disclosed ingredients from within a prior art disclosure, to arrive at compositions "yielding no more than one would expect from such an arrangement". In this instance since the prior art teaches additive or synergistic effects of the combination of atypical antipsychotic agent such as aripiprazole in combination with serotonin reuptake inhibitors as they provide better treatment options for disorders of the central nervous system such as depression with lower side effects, it would have been obvious to one of ordinary skill in the art to combine aripiprazole with a serotonin reuptake inhibitor such as Citalopram or escitalopram One skilled in the art would have been imbued with at least a reasonable expectation that a combination of aripiprazole and escitalopram or citalopram would vield promising results in terms of treating depression resulting in the decrease of deleterious effects associated with neuroleptic treatment alone.

Response to applicant's arguments submitted on 10/26/2009

Applicant's arguments with respect to the previous rejection of the claims. have been considered but are not persuasive in light of this new ground of rejection necessitated by Applicant's amendments to the claims. However, in the interest of a full

prosecution history, the Examiner will address Applicant's arguments as they pertain to the present rejection

Applicant's argument with regards to the examiners response to the unexpected results presented in the declaration is acknowledged but is not found to be persuasive.

Applicants argue that the previously submitted Rule 132 declaration provides unexpectedly superior results. Applicants state that in their test paradigm what was intended in the test was to qualitatively investigate whether the pharmacological functions of the two drugs can exert a synergistic anti-depression effect and the test established that when the two drugs exist in the animal body they show an anti-depressant effect by the interactions thereof, so that a skilled artisan would understand that the two drugs can exert an anti-depression effect only if the pharmacological functions of each of the drugs are qualitatively co-used i.e., the two drugs have a synergistic effect.

Applicant's results have been carefully considered but the Examiner is not persuaded that an "unexpected result" has been demonstrated. As discussed above, aripiprazole has shown additive or *synergistic effects* in the treatment disorders of central nervous systems such as depression when combined with serotonin reuptake inhibitors. (Wong et al). As such, it is not unexpected that aripiprazole also shows a synergistic effect when combined with citalopram or escitalopram. Applicants have presented no evidence that the combination of aripiprazole and citalopram/escitalopram is unexpectedly superior to combinations of aripiprazole with *other* serotonin reuptake inhibitors. In fact, Applicant's results appear to show that aripiprazole demonstrates a

synergistic effect when combined with duloxetine, venlafaxine, milnacipram, escitalopram, paroxetine or sertraline (page 6, 1st paragraph of the submitted 132 declaration dated 03/18/2009).

Applicants are reminded that a "synergistic" effect is not per se unexpected. Evidence of a greater than expected result may also be shown by demonstrating an effect which is greater than the sum of each of the effects taken separately (*i.e.*, demonstrating "synergism"). *Merck& Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989). However, a greater than additive effect is not necessarily sufficient to overcome a *prima facie* case of obviousness because such an effect can either be expected or unexpected.

Applicants must further show that the results were greater than those which would have been expected from the prior art to an unobvious extent, and that the results are of a significant, practical advantage. *Ex parte The NutraSweet Co.*, 19 USPQ2d 1586 (Bd. Pat. App. & Inter. 1991).

In this case, where the prior art suggests and motivates the treatment of depression comprising administration of a combination of aripiprazole with serotonin reuptake inhibitors, it is obvious to combine aripiprazole with other known serotonin reuptake inhibitors for the treatment of depression. One skilled in the art would reasonably expect that aripiprazole combined with serotonin reuptake inhibitors such as citalopram or escitalopram would provide synergistic effect in the treatment of depression. Given the known efficacy of both aripiprazole and serotonin reuptake inhibitors such as citalopram/escitalopram in the treatment of depression when

administered alone or in combination with other antidepressants, the skilled artisan would expect that the combination of aripiprazole with citalopram/escitalopram would also be effective in the treatment of depression. Furthermore, in view of the fact that aripiprazole has been shown to be additive or synergistic when combined with other serotonin reuptake inhibitors, the skilled artisan would not find it "unexpected" that aripiprazole combined with citalopram/escitalopram is also synergistic.

Accordingly, the arguments set forth by the applicant are unpersuasive and the rejection is maintained.

Claim 40 and 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jordan et al., Wong et al. and Harvey as evidenced by Owens et al. as applied to claims 1, 37-39, 41, 43-45, 54-56 and 59-62 above, and further in view of Bando et al (US 2004/0058935, PCT filing date of Sept 25, 2002)

Jordan et al., Wong et al. and Harvey teach as discussed supra and are applied here in the same manner. The cited references do not teach the composition or the method wherein the aripiprazole is anhydrous aripiprazole crystals B.

However, Bando et al teaches low hygroscopic forms of aripiprazole and processes for their preparations thereof which will not convert to a hydrate or lose their original solubility even when a medicinal preparation containing the aripiprazole anhydride crystals is stored for an extended period. (Abstract). Bando et al teaches the disadvantages of using hydrous forms of aripiprazole, (i) the hydrous forms of aripiprazole have the disadvantage of being less bioavailable and less dissoluble than

the anhydrous forms of aripiprazole (ii)the variation in the amount of hydrous versus anhydrous aripiprazole drug substance from batch to batch could fail to meet specifications set by drug regulatory agencies. (iii) The milling may cause the drug substance, conventional anhydride, to adhere to manufacturing equipment which may further result in processing delay, increased operator involvement, increased cost, increased maintenance and lower production yield.(iv) the potential for absorbance of moisture during storage and handling would adversely affect the dissolubility of aripiprazole drug substance. Thus shelf-life of the product could be significantly decreased and/or packaging costs could be significantly increased [0006]. Bando et al teaches a reduced hygroscopic form of aripiprazole which is a crystalline substance defined as Anhydride B which is more amenable to pharmaceutical processing and formulation [0009] According to another embodiment of the fourth aspect of the present invention is provided aripiprazole drug substance of low hygroscopicity wherein said drug substance is aripiprazole Anhydride Crystals B and will not substantially convert to a hydrous form of aripiprazole when properly stored even for an extended period. For instance, said aripiprazole anhydride crystals B can be stored under a relative humidity (RH) of 60% and at a temperature of 25.degree. C., even for a period not less than 4 year [0083]

Therefore, it would have been obvious to one of ordinary skilled in the art to combine the teachings of the cited references above and use aripiprazole B in the compositions and methods taught be Jordan et al, Wang and Harvey and Winnans. An ordinarily skilled artisan would be motivated from Bando et al's teachings of the

disadvantages of the hydrous aripiprazole and the advantages of using anhydrous crystals of aripiprazole B which in medicinal compositions which is increase in stability and decrease in costs. Bando et al's teachings provide an artisan a reasonable expectation of success that using aripiprazole B in place of other aripiprazole in a composition would enhance its stability and ultimately reduce costs.

Response to applicant's arguments filed on 10/26/2009:

In light of the new grounds of rejection above, the arguments submitted on 10/26/2009 which was for the previously submitted rejection is moot. Please refer to the response to arguments after the previous rejection for applicants arguments with reference to their unexpected results.

Conclusion

Claims 1, 37-38, 40-41, 43-45, 54-56 and 58-62 are rejected. No claims are allowed

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAVITHA RAO whose telephone number is (571)270-5315. The examiner can normally be reached on Mon-Fri 7.00 am to 4.00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel can be reached at 571-272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/SAVITHA RAO/ Examiner, Art Unit 1614

/Ardin Marschel/ Supervisory Patent Examiner, Art Unit 1614